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(54) **NONRESONANT TECHNIQUE FOR ESTIMATION OF THE MECHANICAL PROPERTIES OF VISCOELASTIC MATERIALS**

(75) Inventor: **Andrew J. Hull**, Newport, RI (US)

(73) Assignee: **The United States of America as represented by the Secretary of the Navy**, Washington, DC (US)

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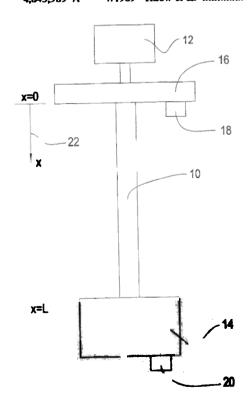
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Primary Examiner—Edward Lefkowitz
Assistant Examiner—C. Dickens
(74) *Attorney, Agent, or Firm*—James N. Kasischke; Michael F. Oglo; Jean-Paul A. Nasser

(57)   **ABSTRACT**

A method for estimating the real and imaginary Young's modulus, shear modulus and Poisson's ratio of a specimen at an excitation frequency. The specimen is first joined to a reciprocating test apparatus at one end with a mass positioned at the other end. The test apparatus reciprocates at the excitation frequency and accelerations are recorded at each end of the specimen. The Young's modulus is calculated from the recorded accelerations. The specimen is then joined to a reciprocating rotational test apparatus at one end with a rotational inertial mass positioned at the other end. Accelerations are recorded upon subjecting the specimen to rotational reciprocations at the excitation frequency. The shear modulus is calculated from these accelerations. Poisson's ration can be calculated from the Young's modulus and the shear modulus at the excitation frequency. All of the calculations may be performed giving both real and imaginary values.

5 Claims, 9 Drawing Sheets